BOILER PLANT EQUIPMENT MECHANIC WG-5309-10

UTILITIES HVAC

I. POSITION AND ORGANIZATION INFORMATION

Position:

Boiler Plant Equipment Mechanic, WG-5309-10

Purpose of position:

The primary purpose of this position is to install, maintain, repair, and modify large/complex heating boilers, and single and multiple fuel power boilers and support equipment including mechanical system controls and distribution lines.

Organization:

Utilities Operation Branch - HVAC Trades

Organization goals:

II. MAJOR DUTIES

B. Duty (Critical):

Plans and lays out work from blueprints, sketches, drawings, specifications, guides, codes, and work orders. Reviews work order requirements reflecting systems, parts, and assemblies to be repaired, modified, or installed. Visits worksite and analyzes, evaluates, and determines damage when planning repair and modification projects. Makes changes to job layout based on site inspection of job. Interprets and applies complex building plans, blueprints, wiring diagrams, engineering drawings, and maintenance and repair manuals to determine material, tools, and equipment needed for the project and how or what repairs need to be made. (16%)

Tasks:

1. Accurately interprets blueprints, sketches, work orders, and specifications and determines project requirements.

2. Efficiently plans sequence of work by accurately determining work to be done and corrective measures to be taken.

3. Accurately determines the proper tools and material required for the job or projects.

Selected Staffing KSAs:

A1, A2, A3, A4, A5, A6, A7

C. Duty (Critical):

Troubleshoots heating boilers, heating systems, and fuel power boilers with complex problems and extensive repairs requiring judgment to locate malfunctions. Uses specialized test equipment to troubleshoot single and multiple fuel power boilers and associated auxiliary and pollution control equipment, such as water treatment systems, chemical dispensers, electrostatic precipitators, bag houses and ash removal equipment, and wet particulate scrubbers. Troubleshoots problem areas and inspects for defective equipment

and faulty wiring. Diagnoses by visual and audible examination of equipment, by application of prescribed test procedures, and by exploration of probable reasons for equipment failure. Tests system operation and detects component malfunctions. Uses infrared, ultraviolet, and related testing devices to determine sources of malfunctions. Conducts test of installed equipment for assembly of components and ensuring compliance with technical orders, manufacturers' handbooks and local procedures. Analyzes diagnostic test readings and operating conditions and isolates system malfunctions.

(16%)

Tasks:

1. Accurately determines causes of defects and malfunctions on assigned equipment.

2. Promptly determines repairs needed through appropriate testing and inspection.

3. Effectively utilizes proper testing instruments and equipment.

Selected Staffing KSAs:

A1, A2, A3, A4, A5, A6, A7

D. Duty (Critical):

Installs, modifies, overhauls, repairs, and maintains a variety of complex heating boilers and/or heating systems, single and multiple fuel power boilers, and associated auxiliary and pollution control equipment. Performs work on power boilers which use gas, oil, wood, coal, refuse derived fuel, tire chips, or a combination of fuels for steam or hot water production and distribution plants. Shapes, sizes, measures, cuts, bends, threads, and repairs piping and tubing and insulates high pressure and high temperature piping and components. Mounts, connects, and adjusts components, such as transformers, motors, electrodes, relays, solenoids, switches, pneumatic and electrical thermostats, rheostats, aquastats, steam gland seals, bearings, and drive gears. Repairs and adjusts hydraulic cylinders, speed governors, feed water pumps, fuel lines, coal pulverizers, combustion fans, air compressors, and coal and ash handling equipment. Performs work on regulating valves, feed water valves, safety relief valves, steam traps, automatic controls, motorized valves, diaphragm valves, solenoid valves, hand valves, etc.

(16%)

Tasks:

1. Properly installs and modifies systems and equipment according to specifications using specialized equipment to meet rigid tolerances.

2. Consistently adheres to repair manuals to meet critical requirement levels and expeditiously completes required repairs.

3. Completes work assignments within established time frames.

Selected Staffing KSAs:

A1, A2, A3, A4, A5, A6, A7

E. Duty (Critical):

Performs preventive maintenance on heating boilers and/or fuel power boiler systems and auxiliary equipment. Inspects and calibrates controls and gauges. Inspects equipment for condition and proper operation. Lubricates components and adjusts super heat on expansion valves. Examines for wear and tear and replaces worn out parts, bushings, linkage pins, and unserviceable system units and components. Tightens loose connections and glands, re-packs or replaces gaskets. Makes chemical analysis of boiler water and runs test for causticity, phosphate, total dissolved solids, etc. Performs internal inspection of boilers to determine if tubes are free of scale and corrosion and performs required maintenance. Performs soldering and oxyacetylene welding, cutting, and brazing to shafts, pulleys, bodies, etc. Performs minor electrical work, such as installing new or defective electric and elctronic wiring systems and controls. Removes and replaces components, such as electric motors, solenoids, switches, inducers, protectorelay, electronic thermostats, volt igniter transformers, and other electronic heating components. (16%)

Tasks:

1. Effectively conducts periodic inspection and scheduled maintenance of systems and components to ensure proper operation.

2. Consistently prevents major damage or system shut-downs by adhering to proper maintenance requirements.

3. Effectively determines what adjustments are necessary and whether parts need to be substituted, replaced, repaired, or purchased.

Selected Staffing KSAs:

A1, A2, A3, A4, A5, A6, A7

F. Duty (Critical):

Utilizes safety practices and procedures following established safety rules and regulations and maintains a safe and clean work environment. Uses and assures proper fit of required safety equipment and clothing, such as safety shoes, glasses, ear protection, face masks, and/or hard hats. Follows federal and state rules when storing, using, handling, labeling, and disposing of hazardous materials and waste in accordance with environmental standards. Performs clean-up duties, such as cleaning equipment, sweeping, straightening, and lining up tools and other property in the assigned area. (16%)

Tasks:

1. Consistently operates equipment in a safe manner, applying established safety rules and regulations to minimize minor violations and to avoid major violations due to employee error or negligence.

2. Strictly adheres to safety and security procedures and regulations and promptly reports any observed or identified violations in accordance with established guidelines.

Selected Staffing KSAs:

A1, A2, A3, A4, A5, A6, A7

G. Duty (Critical):

Uses and maintains tools and equipment. Maintains bench stock levels of parts, materials, tools, and equipment at prescribed levels. Maintains records and documents action. Initiates or annotates forms or reports, such as Operator's Inspection Guide and Trouble Report, Temporary Issue Receipt Form, Base CE Work Clearance Request Form, and updates the Civil Engineering Material Acquisition System (CEMAS). (20%)

Tasks:

1. Properly uses, maintains, and accounts for all types of tools required to accomplish assigned duties.

2. Prepares accurate, complete, and up-to-date record of actions taken and assures documentation is properly signed and coordinated in a timely manner.

Selected Staffing KSAs:

A1, A2, A3, A4, A5, A6, A7

III. KNOWLEDGES, SKILLS AND ABILITIES (KSAs)

A. Selected Staffing KSAs:

1. Knowledge of mechanical, electromechanical, and pneumatic principles to inspect, install, test, maintain, and repair power boilers and associated auxiliary and pollution control equipment.

2. Knowledge of safety regulations, practices, and procedures.
3. Knowledge of regulations, procedures, and policies related to records maintenance and documentation.
4. Skill in troubleshooting complex problems on large projects and applying prescribed test procedures.
5. Skill in the use of hand tools, power tools, and a variety of test equipment.
6. Ability to read and interpret instructions, blueprints, drawings, sketches, and specifications.
7. Skill in dismantling, repairing, and reassembling pumps, to include balancing, aligning, and maintaining turbines, pumps, generators, and ash shredding equipment and preheaters.

B. Basic Training Competencies:

1. Knowledge of mechanical, electromechanical, and pneumatic principles to inspect, install, test, maintain, and repair power boilers and associated auxiliary and pollution control equipment.

2. Knowledge of safety regulations, practices, and procedures.
3. Knowledge of regulations, procedures, and policies related to records maintenance and documentation.
4. Skill in troubleshooting complex problems on large projects and applying

prescribed test procedures.

5. Skill in the use of hand tools, power tools, and a variety of test equipment.

6. Ability to read and interpret instructions, blueprints, drawings, sketches, and specifications.

7. Skill in dismantling, repairing, and reassembling pumps, to include balancing, aligning, and maintaining turbines, pumps, generators, and ash shredding equipment and preheaters.

IV. CLASSIFICATION FACTORS

Factor 1. Knowledge

1. -- Skill in troubleshooting complex problems and in installing and making extensive repairs on large systems.

-- Knowledge of mechanical, electromechanical, and pneumatic principles to inspect, install, test, maintain, and repair complex single and multiple fuel power boilers and associated auxiliary (with complicated components, critical requirements, and rigid tolerance), and pollution control equipment, such as water treatment systems, chemical dispensers, electrostatic precipitators, and bag houses and ash removal equipment.

-- Thorough knowledge of automatic and semi-automatic boiler management systems that use manual, electric, electronic, pneumatic, and mechanical controls.

-- Knowledge of safety regulations and procedures.

-- Skill in using hand tools, portable power tools, and a wide variety of test equipment including special tools, such as acetylene torch, ammeters, electronic leak detectors, control devices, hydraulic press, and micrometers.

-- Skill in dismantling, repairing, and reassembling pumps, to include balancing, aligning, and maintaining turbines, pumps, generators, and ash shredding equipment and preheaters.

-- Skill in reading schematics, blue prints, and technical manuals.

Factor 2. Responsibility

The mechanic independently plans and completes work following the full range of accepted trades practices. Works from work orders, building plans, shop sketches, blueprints, and oral assignment instructions with little or no check during progress. Responsible for making decisions and judgments on complex systems with limited technical guidance. Mechanic is responsible for assuring that all safety procedures and environmental control safeguards are followed when working near hot surfaces, chemical compounds, or moving machinery. Completed work is reviewed by the supervisor for adherence to established practices, outlined objectives, and technical requirements.

Factor 3. Physical Effort

The employee lifts, carries, and handles equipment up to 50 pounds unassisted and over 50 pounds with assistance. Works from ladders, scaffolding

platforms, or cramped areas where equipment, parts, or tools are hard to reach. Work requires frequent stooping, stretching, bending, kneeling, and working in tiring, uncomfortable positions for long periods. In addition, work involves frequent movement and maneuvering of large, heavy equipment using hoists, holders, and pulleys as required.

Factor 4. Working Conditions

The employee works indoors and outdoors, on elevated structures, and in cramped areas. Subject to discomfort from face masks or other protective devices when there is a possibility of exposure to chemicals, heat, steam, noise, noxious gases, fumes, or acids. Occasionally works outside, on top of buildings, in drafty attic spaces, and in cramped areas with low overheads. Subject to possible burns electrical shocks, cuts, strains, bruises, and chemical irritations. To reduce dangers from these and other similar conditions, follows prescribed safety practices and uses safety equipment, such as safety glasses, hard-toe shoes, respirators, hard hats, and fire retardant gloves.

V. CLASSIFICATION SUMMARY

In this position:

Duty B. 16% WG-5309-10 Boiler Plant Equipment Mechanic
Plan and Lay Out Work

Duty C. 16% WG-5309-10 Boiler Plant Equipment Mechanic
Troubleshoot Systems

Duty D. 16% WG-5309-10 Boiler Plant Equipment Mechanic
Install, Repair, and Maintain Systems

Duty E. 16% WG-5309-10 Boiler Plant Equipment Mechanic
Perform Preventive Maintenance

Duty F. 16% WG-5309-10 Boiler plant Equipment Mechanic
Safety Practices

Duty G. 20% WG-5309-10 Boiler Plant Equipment Mechanic
Tools and Equipment

OPM Job Grading Standard for Boiler Plant Equipment Mechanic, WG-5309, TS-65 dated November 1992.

Grade: WG-10